

### Calculation of Potential Risk from Consumption of Breast Milk

Chemical	Cf (mg/kg)	SFo (mg/kg/day)-1	RfD (mg/kg/day)	h (days)	Mother ADDm (mg/kg/day)	Milk Cmf (mg/kg-lipid)	Infant ADDca-i (mg/kg/day)	Infant ADDnc-i (mg/kg/day)	Child ADDca-c (mg/kg/day)	Child ADDnc-c (mg/kg/day)	Mother ELCRm	Infant ELCRi	Child ELCRi	Infant & Child ELCR	Mother HQm	Infant HQi	Child HQi	Infant & Child HQ
PCBs	1.6	2	0.00002	2555	0.0034	38	0.00208	0.024	0.00005	0.0006	3.0E-03	4.2E-03	1.1E-04	4.3E-03	172	1215	32	201
									Factor above acceptable level	=	2951	4165	110	4275	172	1215	32	201
PCBs TEQ	1.90E-05	1.50E+05	NA	2555	4.1E-08	4.5E-04	3.5E-08	4.1E-07	6.5E-10	7.6E-09	2.6E-03	5.2E-03	9.8E-05	5.3E-03				
									Factor above acceptable level	=	2628	5231	98	5329				
Dioxin TEQ	5.10E-06	1.50E+05	NA	2555	1.1E-08	1.2E-04	9.4E-09	1.1E-07	1.7E-10	2.0E-09	7.1E-04	1.4E-03	2.6E-05	1.4E-03				
									Factor above acceptable level	=	705	1404	26	1430				
DDT	0.07	0.34	0.0005	120	0.0002	0.08	6.0E-06	7.0E-05	2.4E-06	2.8E-05	2.2E-05	2.1E-06	8.2E-07	2.9E-06	0.30	0.14	0.056	0.068
									Factor above acceptable level	=	22	2.1	1	3	0.30	0.14	0.056	0.068

#### Notes:

Site-wide, whole-body 95UCL concentration in small mouth bass (Cf) taken from Round 2 Report, Appendix F, Table 3-14.

Acceptable levels are ELCR = 1E-6 and HQ = 1

ELCRm adjusted to 30-year exposure

#### Equations

$$\text{ADDm} = (\text{Cf} \times \text{Irf} \times \text{Conv} \times \text{Ff}) / \text{BWm}$$

$$\text{ADDca-i} = (\text{Cmf} \times \text{Irm} \times \text{f3} \times \text{f4} \times \text{Edi} \times \text{Efi}) / (\text{Ati} \times \text{BWi})$$

$$\text{ADDca-i} = (\text{Cf} \times \text{Irfc} \times \text{Conv} \times \text{Ff} \times \text{Edc} \times \text{Efc}) / (\text{Atc} \times \text{BWC})$$

$$\text{ELCRm} = \text{ADDm} \times \text{Sfo}$$

$$\text{ELCRi} = \text{ADDca-i} \times \text{Sfo}$$

$$\text{ELCRc} = \text{ADDca-c} \times \text{Sfo}$$

$$\text{Cmf} = (\text{ADDm} \times \text{h} \times \text{f1}) / (\ln 2 \times \text{f2})$$

$$\text{ADDnc-i} = (\text{Cmf} \times \text{Irm} \times \text{f3} \times \text{f4} \times \text{Edi} \times \text{Efi}) / (\text{Atni} \times \text{BWi})$$

$$\text{ADDnc-c} = (\text{Cf} \times \text{Irfc} \times \text{Conv} \times \text{Ff} \times \text{Edc} \times \text{Efc}) / (\text{Atc} \times \text{BWC})$$

$$\text{HQM} = \text{ADDm} / \text{RfD}$$

$$\text{HQi} = \text{ADDnc-i} / \text{RfD}$$

$$\text{HQc} = \text{ADDnc-c} / \text{RfD}$$

#### Default Values

Cf chemical specific mg/kg

Concentration of chemical in fish

Irf 142 mg/day

Mother's ingestion rate of fish

Conv 0.001 kg/mg

Conversion factor

Ff 1 fraction

Fraction of fish contaminated

BWm 66 kg

Body weight of mother

h chemical specific days

Half-life of chemical in body

Fone 0.9 fraction

Fraction of ingested chemical stored in fat

Ftwo 0.3 fraction

Fraction of mother's weight that is fat

Irm 1 kg/day

Infant's ingestion rate of milk

Fthree 0.04 fraction

Fraction of breast milk that is fat

Ffour 0.9 fraction

Fraction of ingested chemical that is absorbed

Edi 1 year

Exposure duration of breast-feeding infant

Efi 365 days/year

Exposure frequency of breast-feeding infant

Atc 25550 days

Averaging time - carcinogens (70 years)

Atnc 2190 days

Averaging time - noncarcinogens (ED x EF)

Bwi 9.4 kg

Body weight of infant

Sfo chemical specific (mg/kg/day)-1

Slope Factor - oral

RfD chemical specific mg/kg/day

Reference Dose - oral

Edc 6 years

Exposure duration of child

Efc 365 days/year

Exposure frequency of child

BWc 40 kg

Body weight of child

Irc 16 g/day

Ingestion rate of fish by child

#### Calculated Values

ADDm mg/kg/day

Average Daily Dose to mother

Cmf mg/kg-lipid

Chemical concentration in milkfat

ADDca-i mg/kg/day

Average Daily Dose to breast-feeding infant, cancer

ADDnc-i mg/kg/day

Average Daily Dose to breast-feeding infant, non-cancer

ADDnc-c mg/kg/day

Average Daily Dose to child, non-cancer

ELCRm risk

Excess Lifetime Cancer Risk to mother

ELCRi risk

Excess Lifetime Cancer Risk to infant

ELCRc risk

Excess Lifetime Cancer Risk to child

HQM quotient

Hazard Quotient to mother

HQi quotient

Hazard Quotient to infant

HQc quotient

Hazard Quotient to child